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SEP 21 2006

Application No.: 10/603,924

Docket No.: JCLA7109-R

REMARKSPresent Status of the Application

The Office Action rejected claims 1-2, 4, 31-34 and 37-40 under 35 U.S.C. 102(e), as being anticipated by Skrovan et al. (U.S. 6,277,746). The Office Action also rejected claims 5-7, 35-36 and 41 under 35 U.S.C. 103(a) as being unpatentable over Skrovan et al. (U.S. 6,277,746) in view of Hirabayashi et al. (U.S. 5,575,885). Specifically, the Office Action also rejected claims 1-2, 4-7, 25-30 and 31-41 under the judicially created doctrine of obviousness-type double patenting over claims 1-8 of Hsu (U.S. 6,696,361). Applicants have amended claims 1 and 31 to improve clarity. After entry of the foregoing amendments, claims 1, 2, 4-7 and 31-41 remain pending in the present application, and reconsideration of those claims is respectfully requested.

Response To Double Patenting Rejection

In response to the double patenting rejection, Applicants submit herewith a terminal disclaimer pursuant to 37 C.F.R. §1.321(c). Applicants have submitted the terminal disclaimer solely to advance prosecution of the application, without conceding that the double patenting rejection is properly based. Applicants further declare that the present invention is a continuation application of U.S. Patent 6,696,361. In filing the terminal disclaimer, Applicants rely upon the rulings of the Federal Circuit that the filing of such a terminal disclaimer does not act as an admission, acquiescence or estoppel on the merits of the obviousness issue. See, e.g., Quad

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Environmental Tech v. Union Sanitary Dist., 946 F.2d 870, 874-875 (Fed. Cir. 1991); and Ortho Pharmaceutical Corp. v. Smith, 959 F.2d 936, 941-942 (Fed. Cir. 1992).

**Discussion of Office Action Rejections**

*The Office Action rejected claims 1-2, 4, 31-34 and 37-40 under 35 U.S.C. 102(e), as being anticipated by Skrovan et al. (U.S. 6,277,746; hereafter Skrovan) and asserted that Skrovan discloses all claimed features of the present invention.*

Applicants respectfully traverse the rejections for at least the reasons set forth below.

It is well established that anticipation under 35 U.S.C. 102 requires each and every elements of the rejected claims must be disclosed exactly by a single prior art reference.

The amended independent claims 1 and 31 are allowable for at least the reason that Skrovan fails to teach or disclose each and every features of the amended independent claims 1 and 31. As stated above, claims 1 and 31 recite respectively:

Claim 1. A method of removing contaminants from a silicon wafer after a chemical-mechanical polishing operation, comprising:  
providing a silicon wafer having a layer thereon;  
performing a chemical-mechanical polishing process to remove a portion of the wafer; and

treating the silicon wafer using an aqueous solution of ozone and providing an inertial mechanical force after the chemical-mechanical polishing process is performed, wherein the aqueous solution of ozone is catalyzed beforehand and the inertial mechanical force is provided by a polishing pad.

Claim 31. A method of forming a damascene structure, comprising:  
providing a substrate;  
forming a dielectric layer over the substrate;  
 patterning the dielectric layer to form an opening that exposes a portion of the substrate;

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forming a metallic layer over the substrate so that the opening is completely filled;

performing chemical-mechanical polishing to remove a portion of the metallic layer; and

treating the substrate using an aqueous solution of ozone and providing an inertial mechanical force so that contaminants on a surface of the substrate are removed, wherein the aqueous solution of ozone is catalyzed beforehand and the inertial mechanical force is provided by a polishing pad.

(*Emphasis added*). Applicants submit that claims 1 and 31 patently define over the cited arts for at least the reason that the cited art fails to disclose at least the features emphasized above.

More specifically, in the present invention, on page 10 lines 1-6, Applicants emphasize that before conducting steps S12 and S16, which are the treatment steps performed after the CMP process, the aqueous solution of ozone is catalyzed to improve the clean efficiency of the aqueous solution of ozone.

However, Skrovan fails to teach or suggest that the deionized water containing ozone is catalyzed beforehand. In Skrovan's application, Skrovan only stated that the deionized water containing a small amount ozone due to atmospheric ozone diffusing into the water (as shown in col. 2, lines 4-7). That is, in Skrovan's point of view, ozone naturally diffuses into the deionized water and Skrovan does not even consider to catalyze the ozone in the deionized water for better cleaning result.

Although Hirabayashi et al. (hereafter Hirabayashi) mentions the use of the polishing solution containing hydrogen peroxide (col. 14, lines 37-42), which the Office Action deemed to be the catalyst for catalyzing the aqueous solution of ozone, Hirabayashi fails to teach or suggest that the later performed treatment process, in which the substrate is dipped into an aqueous

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dissolved ozone solution, provided by himself is pre-catalyzed by using any catalyst. That is, Hirabayashi only emphasizes the polishing solution containing hydrogen peroxide. Even though people skilled in the art did combine Skrovan with Hirabayashi, the combination result only presents that the polishing solution in Skrovan's application contains

Therefore, Skrovan substantially fails to teach each and every feature of claims 1 and 31, and therefore, Skrovan cannot possibly anticipate the claimed invention as claimed in the proposed independent claims 1 and 31 in this regard.

Claims 2, 4, 32-34 and 37-40, which depend from claims 1 and 31 respectively, are also patentable over Skrovan, at least because of their dependency from an allowable base claims.

*The Office Action also rejected claims 5-7, 35-36 and 41 under 35 U.S.C. 103(a) as being unpatentable over Skrovan in view of Hirabayashi.*

With regard to Skrovan and Hirabayashi, Applicants respectfully submit that these claims patently define over the prior art for at least the same reasons as discussed above for the 102 rejection. Furthermore, since claims 5-7, 35-36 and 41 are dependent claims which further define the invention recited in claims 1 and 31, Applicants respectfully assert that these claims also are in condition for allowance according to the same reasons as discussed above for the rejection 102. Thus, reconsideration and withdrawal of this rejection are respectively requested.

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CONCLUSION

For at least the foregoing reasons, it is believed that the pending claims 1, 2, 4-7 and 31-41 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,  
J.C. PATENTS

  
Jiawei Huang  
Registration No. 43,330

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4 Venture, Suite 250  
Irvine, CA 92618  
Tel.: (949) 660-0761  
Fax: (949)-660-0809